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Nile.——M. A. Aubry has contributed to a recent issue of the Revue Scientifique an interesting account of his mission to Shoa. His description of the country is rose-color, but the ignorance of its inhabitants is darkly painted. The King believed that his visitor, being an engineer, could make a sword by putting some magic powder into the furnace along with the iron, a chief asked him for a charm against fire; and the people generally, seeing so many things that came from Europe, and not being acquainted with tools or processes, believe that all Europeans have a compact with the devil, and manufacture articles with their hands alone.

Europe.—*European News.*—There are, according to Professor Heim, 1155 glaciers in the Alps. Of these, 249 exceed 7500 meters in length. The total superficial area is more than 500 square miles. France has 144, Italy 78, Switzerland 471 and Austria 462. The Aletsch glacier, in Austria, is the longest. ——From a discussion (St. Petersburg Society of Naturalists) upon the steppes of Russia as compared with those of Hungary and Spain, it appears that the steppes between the Pruth and the Don, like those of Hungary, support agriculture without irrigation, while those beyond the Don and the Volga are more truly Asiatic in character. The desiertos of Spain are more akin to the deserts of Africa than to the steppes of either Central Asia or Europe. The absence of forests was referred (1) to the salt-clays which covered them after their emergence from the sea; (2) to the ruminants which resorted to the steppes when grasses appeared, and (3) to the burning of the steppes by man.——The journey made to Cape North by Srs. Sommier and G. Cini, in January, 1885, is interesting as the first made across Lapland and Finland in midwinter for purely scientific purposes. The goal was reached from Magerö, the northernmost inhabited point, on foot, with comparative ease. Besides the eider and other water fowl, the raven, crow, magpie, Arctic fox and francolin (*Lagopus mutus*)—the last everywhere abundant—were seen. Much valuable information was collected on the Lapps, Quäns, and Northern Finns.——Recent soundings have given the following depths for the Swiss lakes: Constance, between Uttwyl and Friedrichshafen, 255 meters; Geneva, between Rivaz and Saint-Giugolphe, 256 meters; and between Lausanne and Evian, 330 meters; Lucerne, between Gerau and Lueteren, 214 meters; Brienne, 261 meters; Thun, 217; Zug, 198; Neuchatel, 153; Wallenstadt, 151; and Zurich, 143 meters.

GEOLOGY AND PALÆONTOLOGY.

The Permian in Nebraska.—The question has been raised whether there is any true Permian formation in America, but pending its final solution I use the term provisionally to designate a group of strata found along the valley of the Blue river in Gage county, Nebraska. This group is distinguished from the underlying coal measures by the absence of coal and black shales, by the prevailing magnesian character of its limestones, by the presence of certain characteristic indurated marls and oölytic limestone, as well as by the new and distinct types of animal life. The limestones are buff, yellow or blue, full of geodes, large irregular cavities and chert.

There are some indications of unconformity between the coal measures and the Permian, but further investigation is required on this point. The Permian itself varies in dip at different localities. Along the Blue river, from Beatrice to Holmesville, the dip is south-east; along Indian creek, from Wymore to Odell, it is west. These determinations were made by myself in 1885, and during the present year Mr. W. C. Knight obtained the same results. The total thickness of the Permian is not less than two hundred feet. Exact determination of the thickness can not, however, be made until the dip has been more fully determined. There is decided unconformity by erosion at the top of the Permian. The overlying Dakota group of the Cretaceous period occupies the hollows which were cut into the Permian during the long period in which Triassic and Jurassic strata were forming in other parts of the continent, this region having been a land surface at that time.

A valuable collection of the fossils of this formation has been made by W. C. Knight, and was displayed at the Buffalo meeting. Among the characteristic new types were a gigantic Pinna and a fine cephalopod intermediate between Nautilus and Ammonites. Besides the presence of types undoubtedly new and approximating Mesozoic forms, the great diminution of typical Carboniferous species is noteworthy. Of 123 species enumerated by Meek from the coal measures along the Missouri river in Nebraska, not more than a dozen run up into the Permian. As the Permian is only a subdivision of the great Carboniferous system, the presence of some common forms is to be expected.

The old maps represent the Permian as extending from the Kansas boundary line north-eastwardly to the Platte river. This seems to be an error, the characteristic rocks and fossils of this formation having been certainly identified only in the valley of the Blue river. The surface exposure of the Permian occurs almost wholly in Gage county, possibly extending a little way into the counties of Lancaster, Saline and Jefferson.

It must be admitted that many of the claims hitherto advanced for the existence of Permian rocks in certain localities, have been ill-advised. But previous errors in the way of confusing coal measure species with Permian species should not be permitted to prejudice any new and valid evidence. If we turn our attention to the course of events in the geological history of the eastern part of the continent about the close of the Paleozoic era, we perceive that vast physical changes intervened between the deposition of the latest Carboniferous and the earliest Mesozoic rocks. The Appalachian mountains were raised up, and with them came the greater part of the continent east of the Mississippi river and was added to the stable dry land. A gap in the life of the earth as tremendous as the physical change just mentioned, intervenes between the coal measures and the Triassic. These mighty changes in the distribution of land and water, this immense stride forward in the life-history of the earth required a long period of time. Was there no sedimentation, no rock-forming going on anywhere in America during that time? It is highly probable that there was, and the rocks then formed ought to be called Permian, though they may not, in their lithological composition or the fossils they contain, exactly agree with the Permian of Europe.—*L. E. Hicks, Univ. Nebraska.*

THE RECENT EARTHQUAKE IN THE UNITED STATES.—For the first time in our history the south-eastern portion of our country has been visited by an earthquake of serious power, which has resulted in great destruction of property and loss of life. The city of Charleston, S. Ca., has been so seriously shaken that it is said that a very large majority of its houses have been rendered unfit for habitation, and at least sixty persons have been killed. The following reply of Dr. J. W. Powell, of the U. S. Geological Survey, to a despatch of Secretary Topley of the British Association for the Advancement of Science, gives a general view of its character:

"The earthquake was the most severe on record in the United States, and affected the greatest area. Its origin was along the line of post-Quaternary dislocation on the eastern flanks of the Appalachians, especially where it crosses Central North Carolina. Slight premonitory shocks were felt in the Carolinas for several days, moderately severe shocks occurring near Charleston August 27 and 28. The principal shock, causing the great destruction in Charleston, originated in Central North Carolina, August 31, at 9.50 P. M., 75th meridian time. Thence the shocks spread with great rapidity in all directions with a velocity varying from twenty-five to sixty-five miles a minute, over an area of 900,000 square miles, or one-quarter of the United States, embracing twenty-eight States, from the Gulf of Mexico, the Great lakes and Southern New England, and from the Atlantic sea-board to the Central Mississippi valley. In the Carolinas it was accompanied by landslides, crevasses, and great destruction of property. Half of Charleston is in ruins, more than forty lives lost. No sea wave yet reported."

There are many phenomena of disturbance in all parts of the region which was shaken most severely. At Summerville and Ten Mile station, near Charleston, and for a great distance along the coast, there are numerous craters from which mud and water were discharged. Near the Coosaw mines, S. Ca., there is a crack in the earth 200 feet long and six inches wide at the top. On St. Helena island, off Beaufort coast, several large openings were made and piles of mud and sand were forced up. Passengers on the first through train from Charleston to Savannah since the earthquake Thursday, say that holes in the earth resembling wells have opened in the neighborhood of Charleston and for miles along the coast. They vary in diameter, but average two feet. Mica and other minerals not known in that section before, are found around their mouths. Mud of a bluish color oozes from fissures in the ground surrounding them, and the water savors of soda. People living near them report that when the water first burst forth from the ground it was steaming hot and shot fifty feet into the air. On Pac island, near Beaufort, a fissure in the earth, twelve feet wide and 400 feet long, still remains. All the islands in that vicinity report similar fissures, with mud and water issuing from them.

Disturbances are reported from the Black mountains of North Carolina, but nothing of a reliable character has reached us from that quarter as yet. We shall await with interest information from this region, and will hope that some geologist, competent from familiarity with those mountains, may make a detailed investigation of their present condition.

Some comments on the probable cause of the earthquake will be found in our editorial department.

GEOLOGICAL NEWS.— *General.* — The detailed catalogue and guide to the geological exhibits of New Zealand in the Indian and Colonial exhibition, by Jas. Hector, contains a full description of the strata of the islands, with map. The Cretaceous and Tertiary are grouped under the title of Cretaceo-Tertiary.——The History of Fossil Crocodiles, by A. S. Woodward, gives an account of the order from its first appearance in the Trias to the present time, with notes upon the localities in which the various genera have been found, and a list of genera. In the Triassic Belodon the order seems to have its inception, but this genus has many dinosaurian and lacertilian characters. In Belodon the posterior nares are not displaced backwards as in recent crocodiles, while the Liassic and Wealden crocodiles approach nearer to living forms in this respect.——Mr. A. S. Woodward also reviews the genus Notidanus. No undoubted traces of the genus can be found in beds beneath the Middle Oölite. Twenty-three fossil species, eight Jurassic, four Cretaceous and the others Tertiary, are enumerated.——The Memoirs of the St. Petersburg Imperial Academy of Sciences include extensive studies of Russian fossil reptiles, by W. Kiprijanow. Part III (1883) contains descriptions of Thaumatosauria from the chalk and Moscow Jura, belonging to the genera Polyptychodon, Thaumatosaurus and

Lutkesaurus. Part IV contains various notes on Sauropterygia and some undetermined fossils, and a description of *Pœkilopleuron schmidti*, a crocodilian.——The gneisses and schists of the Sinaitic peninsula, with similar rocks in Upper Egypt, are by Professor Hull referred to the Laurentian. Newer slates and schists with igneous rocks flank these, and are probably pre-Cambrian. The Cambrian, Silurian, and Devonian seems to be unrepresented in this region, the next rock in ascending order being the "desert sandstone" (sandstones, conglomerates and limestones) enclosing carboniferous fossils. Overlying these rocks, which are not very extensive, is the Nubian sandstone, which cannot be distinguished from it by mineral characters, but which seem to be Cretaceous, though it may be Jurassic or Triassic. Above this is the Cretaceous limestone, corresponding in age to the European chalk. This constitutes the mass of the hills in Palestine.——Dr. Schweinfurth has recently announced, in the Bulletin of the Egyptian Institute for 1885, the discovery of stems of crinoids, and of an Athyris allied to *A. concentrica*, in sandstone hitherto regarded as Nubian sandstone. Thus the lower part of the Nubian sandstone may prove to be Carboniferous.

Carboniferous.—Professor J. R. Jones states that in the Carboniferous formation of Great Britian 170 species of Ostracoda have been found belonging to thirty-three genera and nine families. The Carboniferous limestone of Southwest Scotland, especially the shales of the lower beds, is highly productive of Ostracoda. A great variety of genera and species were from beds at or near the base of the Scar limestone and its equivalents in Northumberland, Cumberland, Westmoreland and North Lancashire. The calcareous shales of the Yoredale series have several interesting forms. The middle coal-measures have five species of Carbonia, Beyrichia one, Philomedes one; the lower have a Beyrichia and a Carbonia; the upper *B. subarcuata*, while the latest Carboniferous ostracod is *Leperditia inflata* in the Spirorbis limestone.

Jurassic.—M. Stanislas Meunier finds four genera (Tigillites, Crossochorda, Equihenia and Eophyton) among the curious fossils, analogous to the Silurian bilobites, collected from the Jurassic beds of Equilien (Pas de Calais, France).

Tertiary.—M. L. Dollo, apropos of the remains of a tortoise found at Melsbrook, near Vilvorde (Belgium) some ten years ago, reviews and mainly adopts the classification of Professor Cope. He proposes the name Thecophora for shelled tortoises, unites the cryptodire family Propleuridæ with the Cheloniidæ, and establishes a family Eurysternidæ. The tortoise in question was taken from the "Bruxellian" (Lower Eocene) beds, and is a cryptodire of the family Chelydridæ. M. Dollo names it *Pseudotrionyx delheidi.*——Mr. R. L. Lydekker, after a reëxamination of the specimens from the bone-bed of the red crag in the

British and Ipswich museums, believes that three species of Mastodon, *M. arvernensis*, *M. longirostris* and *M. borsoni* are represented; that *Hyæna arvernensis* and *H. antiqua* are probably identical with *H. striata*; and that there are two forms of Sus, the larger probably *S. erymanthius* or *S. antiquus*, the smaller *S. palæocherus.* The other quadrupeds are a tapir, more likely *T. arvenensis* or *T. elegans* than *T. priscus; Hippotherium gracile*, and a Rhinoceros, probably the hornless *R. incisivus* (though *R. schleiermacheri* probably also occurred). A species of albatross was also represented.

Quaternary.—M. A. de Lapparent (Bull. d. l. Soc. Geol. de France, 1885, 456) traces the origin of the yellow silicious silt of the plateaux of the Paris basin. He points out that wherever the edge of this bed is seen against a line of heights, veins of small angular flints are seen, and shows that in character the mud exactly resembles that left by melted snow or running rain water—an oxidized mud which has always been in contact with the air. Nowhere else in France does this yellow mud cover so large an extent. It is, M. de Lapparent believes, the impalpable residue of the ancient Tertiary deposits, and its thickness is proportionate to that of those deposits. During the glacial period the flints, alternately subjected to freezing and melting, crumbled to pieces. M. de Mercey, in a subsequent note upon the same subject, shows that the Quaternary gravels were deposited in the water synchronously with the formation of the alluvium at higher levels. When these beds are found superimposed in the terraces of the valleys, the alluvium is not contemporaneous with the gravel it rests upon, but with that at a lower level. M. de Mercey also maintains the distinctness of an atmospheric bed of glacial mud, which was formed by the crumbling of the flints in the manner indicated by M. de Lapparent.

BOTANY.[1]

BOTANICAL WORK OF THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.—The recent meeting of the association at Buffalo showed no diminution of the interest taken by botanists in these annual gatherings. The number of botanical papers presented was small but of good quality. It is noticeable that they include no physiological subjects, and that the tendency is strongly toward the systematic side of botany, which may be taken as indicating the prominent position which this phase of botanical science still maintains with the leaders. The following is the list of papers presented:

1. The bulliform or hygroscopic cells of grasses and sedges compared. By W. J. Beal.

These cells are modified epidermal cells which occur in groups

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[1] Edited by Professor CHARLES E. BESSEY, Lincoln, Nebraska.